

Human Spaceflight Network Support Group

May 16-17, 2001



***Regents Park III
Johnson Space Center
Houston, Texas***



Network Support Group Meeting

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 Houston, Texas**

----- Agenda -----

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| Introduction | T. C. Sobchak/NASA/GSFC |
| DSMC Transition Plan and Status | |
| • Engineering | F. Kleinknecht/CSOC/Houston |
| • Operations | B. Gonzales/CSOC/WSC |
| • GSFC SN Monitoring Capabilities | F. Kleinknecht/CSOC/Houston |
| • NISN Implementation | M. Mascari/CSOC/GSFC |
| • Vector Management | J. Cappellari/CSOC/GSFC P. Powers/CSOC/GSFC |
| WAN Status-Implementation vs. Requirements | |
| • NISN Audit | M. McCutchen/CSOC/MSFC |
| MIL Critical Path | |
| • NISN | C. Dry/CSOC/GSFC |
| • Operations/Equipment | H. Schenk/CSOC/GSFC |
| ATM Update Plan and Schedule | S. Calvelage/CSOC/MSFC |
| PRD Review Plan | C. Dry/CSOC/GSFC |
| NACAIT Status | J. Aquino/NASA/SOMO/JSC |
| ASRS System Transition Status | D. McKinley/NASA/KSC |
| ISS Assembly Plan | R. Marriott/CSOC/JSC |
| SSP Flight Plan Overviews | |
| • STS-104, -105, -107, -108 | R. Marriott/CSOC/JSC |
| EMCC Procedures Update Plan | J. Sidotti/CSOC/GSFC |
| Ascent Flight Rules Update | W. Foster/CSOC/JSC |
| GSFC Calibrated Ancillary System (CAS) Data Requirements | |
| • Supplier | F. Ibanez/USA/JSC |
| • User | J. Sidotti/CSOC/GSFC |
| Orbiter Comm Upgrade | L. Moore/NASA/JSC |
| SOMO ISS/Shuttle Alternate Architecture | J. Aquino/NASA/SOMO/JSC |

| | |
|--|-------------------------|
| Shuttle Auxiliary Instrumentation System (AIS) | R. Yates/NASA/JSC |
| Solid State Recorder | |
| • Design Plan | J. Miller/NASA/JSC |
| • Ops Plan | D. Miller/NASA/JSC |
| Voice Switch Upgrade | M. Mascari/CSOC/GSFC |
| E&M Keying | B. Schneck/CSOC/GSFC |
| Shuttle 50-Mbps Data Modem Upgrade | M. Mascari/CSOC/GSFC |
| NASCOM Block Phase-Out | L. Muzny/CSOC/JSC |
| NISN PTP – SCD 5.0 Status | J. Volosin/CSOC/GSFC |
| TDRS-H On-orbit Status | T. C. Sobchak/NASA/GSFC |
| AFSCN Shuttle Proficiency Passes | S. DuBridge/USAF |
| LION UHF Over Modulation | C. Gatewood/AFSCN |
| Schriever Transition and Cost Estimate | Maj. Montgomery/USAF |
| CSOC Configuration Management Policy | B. Schneck/CSOC/GSFC |
| • NISN | J. Volosin/CSOC/GSFC |
| MIL/PDL Commercialization | R. Sabatino/CSOC/JSC |
| WSC/MSFC ICD | D. Seymour/CSOC/MSFC |
| CSA Engineering Evaluation | M. Mascari/CSOC/GSFC |
| ISS Scheduling and Critical Periods | J. Sidotti/CSOC/GSFC |
| ISS/SSP Ops Splinter Summary | J. Sidotti/CSOC/GSFC |
| VHF Support Splinter Summary | F. Pifer/CSOC/GSFC |
| NLIC/WAN Support Summary | M. Mascari/CSOC/GSFC |
| ATV/HTV Program Support | J. Smith/CSOC/GSFC |
| X-38 Program Status | J. Siekierski/NASA/JSC |
| X-38 Deployment Timeline | S. McMillan/NASA/JSC |
| Dryden Status | C. Griffith/NASA/DFRC |
| Action Items | T. C. Sobchak/NASA/GSFC |

----- Splinter Meetings -----

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|--------------|--|-----------------------------|--------------------|
| May 14, 2001 | FDF Splinters | Regents Park III, Room 201A | 1:30-3:30 p.m. |
| May 14, 2001 | X-38/V-201 Support and Network Resources | Regents Park III, Room 205A | 2:00-3:30 p.m. |
| May 15, 2001 | Solid State Recorders Long-term Support of Ops Recorder FM Dumps | Regents Park III, Room 201A | 9:00-11:00 a.m. |
| May 15, 2001 | ISS/SSP Plans/Operations and DSMC | Regents Park III, Room 204A | 1:00-3:30 p.m. |
| May 15, 2001 | ISS Scheduling and Critical Periods | Regents Park III, Room 204A | 3:30-5:00 p.m. |
| May 15, 2001 | NISN Splinter | Regents Park III, Room 205A | 1:00-5:00 p.m. |
| May 17, 2001 | LION UHF | Regents Park III, Room 205A | 9:00-11:00 a.m. |

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I. Introduction

Mr. Ted Sobchak (NASA/GSFC/ND) convened the May 16 –17, 2001, Network Support Group (NSG) meeting to discuss Space Shuttle Program (SSP) and International Space Station (ISS) issues relevant to the Network. Mr. Sobchak noted that the last NSG meeting was conducted in August 2000. Mr. Sobchak stated that JSC MOD has expressed their gratitude to the Network for the excellent support they provided during a very aggressive ISS/SSP support period.

Following introduction of meeting attendees, material was presented as noted in paragraphs II through XXXVII.

II. DSMC: NISN Implementation

Ms. Michele Mascari (GSFC/NISN) discussed NISN circuit implementation for DSMC. Currently, there are plans to implement one T1 circuit on the Closed Ionet, one T1 on the Open Ionet, one T1 for voice, and two 64-kbps circuits from JSC to WSC for UPS. An action item was assigned to Mr. Fred Kleinknecht (CSOC/Houston) to provide a breakdown of DSMC specific circuit requirements and a detailed diagram of the circuit interfaces (Action Item 5-01-NSG-01).

III. DSMC Transition Schedule Status

Mr. Kleinknecht discussed the DSMC transition schedule and GSFC SN monitoring capabilities. GN and SN scheduling functions are being transferred to WSC. The entire DSMC transition is expected to be complete by January 2002.

Regarding GSFC SN monitoring capabilities, Mr. Kleinknecht reviewed a list of capabilities that will be provided at GSFC. Mr. Gary Morse (JSC/SOMO) expressed some concern regarding having only one X-terminal placed in the GSFC MOSA. Mr. Bruce Schneck (GSFC/CSR) concurred with Mr. Morse, noting that one terminal will not be sufficient because there are several positions (SMM, CSR, ND, etc.) that will require use of the terminal.

Three action items were assigned as a result of Mr. Kleinknecht's presentation. The first was assigned to Mr. Kleinknecht to develop a customer interface forum to communicate DSMC transition plans to the customer community (Action Item 5-01-NSG-02). The second was assigned to Mr. Kleinknecht to provide a copy of the DSMC transition plan to Mr. Sobchak for dissemination (Action Item 5-01-NSG-03). The third action item was assigned to Ms. JoAnn Sidotti (GSFC/SMM) to coordinate with Mr. Kleinknecht regarding Mission Support Center requirements for SN monitoring (Action Item 5-01-NSG-04).

IV. DSMC Overview

Mr. Robert Gonzales (WSC) provided a DSMC overview. The SN and GN scheduling systems located at the NCC and Wallops Scheduling Office (WSO) will be relocated to the DSMC. The GN transition from WSO Scheduling to DSMC will be a parallel operation with the legacy customers transitioning first, automated customers second, and STS and ISS last. The SN

transition from the NCC to the DSMC will be a 21-day process that will align with the SN scheduling calendar. A detailed SN fallback plan, which will allow for a contingency handover back to the NCC if necessary, has been developed. Changes required of the STS and ISS Mission Control Centers during the transition will be coordinated well in advance of the cutover and will consist of NISN IP address changes and Scheduler call sign changes. Real-time customer command and telemetry data flow will not be affected. NISN data and voice control will remain at GSFC and the services provided will not change. FDF will remain at GSFC and the services provided will not change. Mission planning and Network Integration and Analysis (NIA) functions will remain at GSFC.

Mr. Gonzales discussed DSMC transition milestones. The NCC GN Scheduling function has been merged with the WSO. WSO GN Scheduling operations for STS are scheduled to transition to the DSMC during the STS-108 mission in November/December 2001. Most NCC Operations functions that do not require the NCCDS have already transitioned to the DSMC. The DSMC ORR will be held in February 2002. NCC Scheduling and vector management functions will transition to the DSMC following the ORR. STS vector management training for WSC Ops and the WSC Orbit Analyst has been initiated and is estimated to be completed in late 2001. The NCC TM and Jim Cappellari of the FDF are providing the vector management training of WSC personnel.

Mr. Gonzales discussed DSMC transition risk mitigation. To ensure that WSC operations personnel are adequately trained on STS launch vector management requirements, Jim Cappellari and WSC Operations Management will identify the STS mission for which the WSC personnel will begin performing in a stand-alone capacity. Based on the current STS launch schedules, DSMC GN Schedulers will produce parallel schedules for STS-104 and 105 while Wallops produces parallel schedules for STS-108. Following STS-108 WOW, a Transition Readiness Review (TRR) will be held and, pending the approval of the TRR, the scheduling hardware at WFF will be dismantled. Following the SN scheduling handover in February 2002, STS-110, STS-107, and STS-111 will be supported by the DSMC with the NCC providing a contingency fallback capability. To avoid impact to critical customer activities, all critical activities will be factored into the DSMC Master Transition Schedule. Mr. Gonzales noted that all critical customer activities (i.e., launches, HST Servicing Missions, etc.) should be forwarded to your Customer Service Representative (CSR) for inclusion into the DSMC Master Schedule. Any changes in customer schedules should be coordinated as soon as practical. CSRs will be kept current on the progress of DSMC activities and all CSRs will be provided the latest DSMC Master Schedule.

Two action items were assigned as a result of Mr. Gonzales' presentation. The first was assigned to Mr. Gonzales to identify the changes needed at the control centers and projects for the DSMC transition (Action Item 5-01-NSG-05). The second was assigned to Mr. Kleinknecht and Mr. Steve Sypher (WSC) to explain how the DSMC Transition Plan will adhere to the JSC-2 Flight Follow Plan (Action Item 5-01-NSG-06).

V. DSMC Transition/Vector Management

Mr. Jim Cappellari reported that NCCDS overview and training sessions for WSC Site Specialists (SSs) and TDRS Analysts (TAs) were held at GSFC from April 12 through April 20, 2001. The overview and training sessions were very successful in introducing the WSC personnel to the NCCDS system. Extensive additional training, simulation, and certification will be required for these and other WSC SSs and TAs, along with flight follow experience, before the operational handover of the Shuttle vector processing responsibilities to WSC. An FDF Analyst will be present at WSC for support of the first two or three Shuttle launches after operational handover.

Mr. Cappellari noted that a WSC Training and Certification Plan is needed. An action item was assigned to Naresh Bansal (DSMC Program Manager) to ensure that a WSC/FDF Training and Certification Plan is developed and goes through the appropriate review cycles (Action Item 5-01-NSG-07).

VI. DSMC Status of WOTIS for GN Scheduling of SSP/ISS Programs

Ms. Sidotti presented the subject matter. Ms. Sidotti stated that the WOTIS system (hardware and software) has been installed at WSC. Debbie Dukes/Wallops recently completed two weeks of initial training at WSC. Ms. Dukes will travel to WSC and conduct additional training before each group of satellites is transitioned to the new system at DSMC/WSC. STS missions will begin transitioning on the first mission after successful completion of legacy and automated transitions. STS transition activities will begin approximately six weeks out from launch with the mission testing activities and continue through launch and the mission period. Following successful transition of STS scheduling, ISS will begin their VHF scheduling transition.

There was a discussion regarding how the existing data service provided for JSC GN scheduling (i.e., Leroy Henry) will continue into the DSMC era. An action item was assigned to Steve Sypher (WSC), Fred Kleinknecht (CSOC/Houston), Bruce Schneck (CSR/GSFC), JoAnn Sidotti (GSFC/SMM), and Bob Hudgins (WSC) to determine how this will be accomplished (Action Item 5-01-NSG-08).

VII. Mission Communications Audit

Mr. Mark McCutchen discussed the Mission Communications Audit. Primary and alternate paths for real-time critical requirements were identified. MSFC has been actively working with circuit providers to ensure service delivery meets expectations. A meeting was recently conducted between AT&T and MSFC where 2-hour restoral services were discussed. AT&T stated that they would look into what 2-hour restoral services they cannot meet. If AT&T doesn't feel that they can rely on certain locations (e.g., Quest) to meet the 2-hour restoral times, they will inform MSFC. Ongoing meetings between AT&T and MSFC are scheduled.

VIII. MILA Critical Path Audit

Ms. Cheryl Dry presented an overview of the MILA critical path audit. Problems were encountered on the command thruput interface during the TCDT for STS-101. Follow-on missions also encountered various problems with command thruput circuitry. Because of these problems, an audit was conducted on the communications path from JSC thru GSFC and KSC and on to MILA/PDL. Problems were identified and recommendations were provided. Issue resolution is in process. Two action items were assigned as a result of this presentation. The first was assigned to Mr. Rod Thornton (KSC) to determine whether KSC can provide another path through TMS from MILA to PDL (Action Item 5-01-NSG-09). The second was assigned to Messrs. Jim Porterfield and George Gassier (MSFC/NISN) to determine how long it will take to get a cost estimate for conduit diversity in the tunnel from the KSC Toll Building to CD&SC (Action Item 5-01-NSG-10).

IX. MILA Critical Path Launch Support Audit

Mr. Harry Schenk presented the subject matter. Mr. Schenk stated that in the operations area, it is desired to offload some on-orbit support on MILA. In the systems area, there are systems that are potential single points of failure. There are MFRs at MILA that are about 35 years old and reaching the obsolescence stage. This issue needs to be addressed. Training is another issue. An MFR class is currently underway. Regarding the MBR system, there is a little bit of legacy in it. The system was moved into operations prior to CSOC, and may not have been ready to go prime. The system went operational with several DRs (approximately 28 Level 2 DRs) against it. With Level 2 DRs, there has to be some kind of failover to survive. There are still approximately 100 Level 3 DRs open against the system. This needs to be addressed also. Mr. Morse inquired about the TAP failure. Mr. Schenk stated that the TAP problem is a Level 2 DR. Mr. Sobchak stated that all possible workarounds for the TAP problem are being looked into. Since the TAP failure, there has been some software work performed on the TAP. However, since the failure cannot be duplicated, the problem may not be fixable. Mr. Eric Clemons has been tasked with looking into the TAP problem.

X. SSP Flight Plan Overview

Mr. Robert Marriott presented an SSP Flight Plan overview. Mr. Marriott provided launch dates and general information for STS-102 through STS-105 and ISS 5A.1 through ISS 7A.1.

XI. Program Requirements Document Review

Ms. Cheryl Dry stated that as a result of the NISN audit, it was determined that PRD documentation is in need of review/update. GSFC is presently planning a review of OPS Flight PRD Vol 1, sections 2730, 2736, 2760, and 2766. Points of contact for review of the document have been identified at supporting centers. GSFC will conduct an in-house review of Sections 2730 and 2736 on June 14 and 15, 2001. Following the in-house review, a teleconference will be conducted with supporting centers to review these sections. Upon agreement by all, changes will

be submitted to Ms. Patricia Mattingly/JSC. Upon completion of this review cycle, a review of sections 2760 and 2766 will be scheduled.

XII. Orbiter Comm. Upgrades

Ms. Lisa Moore reported on orbiter comm. upgrades. Ms. Moore stated that some kind of deployable antenna would be utilized. It will be a standard K-band TDRS user. JSC will continue to develop requirements on how to interface with TDRS. Regarding dump rates, JSC will ask that the flight system be designed to support 150 Mbps.

Ms. Moore stated that discussions have been held with Mr. Sobchak regarding alternatives to FM ground stations. Ms. Moore stated that Mr. Sobchak needs to go to the Program and state that FM ground stations will not be used. TV will be digitized. CCTV will be digitized before being shipped Ku-band.

XIII. ASRS Migration Update

Mr. Derwood McKinley provided an ASRS migration update. Unit testing is continuing with USA and Boeing. ASRS will go operational on October 4, 2001. Mr. McKinley stated that the UDS format 79 to 96 conversion program is written and tested. Mr. McKinley also stated that some problems were encountered with the browser printing capabilities. This problem was fixed by replacing Tarantella (the tool which deploys the ASRS application to the Internet) with NFUSE. Mr. McKinley stated that ASRS documentation will be complete by the end of May 2001. The ASRS Validation Phase, which will be a major effort, is from May 3, 2001, to September 10, 2001. There are three time periods available for ASRS training (July 16 to 20, July 30 to August 3, and August 6 to 10).

Mr. McKinley stated that a major enhancement has been made to ASRS. Remote access is now obtained directly through the ICA client. Mr. McKinley stated that ICA client software (executable files) would be e-mailed to all users of the systems.

Ms. Mattingly noted that ASRS will have a Web page containing PRD documentation. Ms. Mattingly suggested that parties accessing PRD documentation from this page for specific requirements call her to ensure the requirement hasn't been updated in the last 30 days.

XIV. SAMS and CAS Data

Ms. Sidotti discussed SAMS and CAS data. The data that drives the SAMS display is CAS. CAS data goes to KSC, WSC, and GSFC (Hitchhiker and FDF). Ms. Sidotti stated that with the delivery of Flight Software OI-28, twelve CAS parameters defining the TDRS in view of the Orbiter were deleted from the CAS data stream delivered to external users. This began with STS-98 and has continued for the last two missions (STS-102 and STS-100). Mr. Rick Kraesig/JSC noted that the parameters are still in the data set, but are no longer coming down from the orbiter. Different parameters need to be identified. JSC will update the CAS software, GSFC Analysis will update the SAMS software code, and testing will be conducted to verify changes.

XV. CAS Update Status

Mr. Frank Ibanez stated that OI-28 (done prior to STS-98) changed mission support identifiers (MSIDs) in orbital downlink telemetry to accommodate additional ephemeris data requirements for the orbiter. Certain MSIDs used to define CAS parameters for external users were deleted or re-designated. This impacted the use of CAS data to drive the Shuttle Antenna Management System at GSFC/NCC and WSC. This problem continued for the next two Shuttle missions. To resolve the problem, a total list of parameters affecting CAS has been submitted to CSOC software developers. Support requirements have been written by CSOC to incorporate changes in the next PDIS FEPS software release for the MCC. The next MCC software release (Ganymede) is scheduled for mid-September 2001.

Two action items were assigned as a result of this presentation. The first was assigned to Messrs. Harry Berman (NCC) and Ibanez to define what CAS parameters GSFC needs for the next two SSP flights and how Mr. Ibanez can send the data block to GSFC (Action Item 5-01-NSG-11). The second was assigned to Ms. JoAnn Sidotti to ensure that Mr. Berman contacts Mr. Ibanez regarding this issue (Action Item 5-01-NSG-12).

XVI. EMCC Procedures Update

Ms. Sidotti presented the subject matter. The EMCC Activation and Operations Procedures document was last updated in September 1997. Because of the numerous changes the Network has undergone in the last four years, the document is in need of update. A team has been formed to conduct a review and revision of the document. These elements are requested to begin reviewing the document by May 28, 2001. Redlines are due by August 7, 2001. Final review/signature is slated for September 21, 2001. The EMCC document is currently available on the Internet (Docushare). Ms. Sidotti will also e-mail the document to pertinent parties for review. Copies of the limited telephone supplement can be obtained from Larry Kort or Laura Huey of the GSFC documentation group.

XVII. Small Conversion Device Release 5.0 Status

Mr. Jeff Volosin presented Small Conversion Device (SCD) Release 5.0 status. Deployment of SCD 5.0 was completed in March 2001. Transition to SCD 5.0 has not been completed for Chandra (awaiting Board of Directors approval to implement operationally). Transition also has not been completed for STS 72-kbps forward due to a "hanging" problem with SCD 5.0. Mr. Volosin met with JSC representatives on May 15, 2001, and they don't feel confident enough to use SCD 5.0 for STS-104 72-kbps FWD due to the "hanging" problem.

Upgrades to SCD software that are currently being considered include SCD 5.1, SCD 5.2, and SCD 5.3. SCD 5.1 will not be scheduled for Network-wide release. Initial release will be limited to GSFC MIG devices and local GSFC CDs. SCD 5.1 is virtually the same as SCD 5.0 except for a few minor updates.

Mr. Morse inquired as to what has been done to address the “bursting” problem. Mr. Volosin stated that a patch has been implemented in SCD 5.0. MSFC, JSC, and CD&SC have the patch. Any other site that receives 5.0 from this point on will also have the patch. The patch will also be implemented in SCD Releases 5.1, 5.2, and 5.3.

Mr. Bruce Schneck expressed some concerns regarding configuration management of all SCD releases (5.0, 5.1, 5.2, 5.3). Mr. Schneck stated that he is concerned that the CD Manager will have to make adjustments for each release.

Mr. Volosin stated that SCD 5.3 is not currently funded by Code 290. Funding may be available by the end of the year.

XVIII. UHF Air-to-Ground E&M Keying Status

Mr. Bruce Schneck discussed UHF Air-to-Ground (A/G) E&M Keying status. Mr. Schneck stated that the new switch at JSC would not pass quindar tones. The GSFC VSS will only pass in-band signals. A temporary quindar tone generator circuit was installed at JSC after the switch. Permanent E&M to quindar tone generator equipment was installed at GSFC and tested prior to the STS-98 TCDT with no problems experienced.

Erroneous keying of MILA’s UHF transmitter was experienced during STS-98 TCDT. The E&M to quindar tone keying equipment was bypassed at GSFC for the STS-98 mission. Post-mission troubleshooting found intermittent frame errors on the circuit (false E-lead transitions) that caused transmitter keying. False E-lead transitions are only identified during long duration characterization tests (spurious problem). The circuit was monitored during the month of April 2001 for amount and duration of errors and was found to be within the NSAP specifications (99.5% error free seconds and 99.95 % availability). The solution to eliminate the effects of false E-lead transitions is to replace the transfer relay with a time delay-to-operate relay. The relay will filter false E-lead transitions. The delay adds a 150-msec delay in the audio path. Testing with JSC will be conducted between the STS-105 EOM and the STS-108 TCDT (July – November 2001). The STS-109 TCDT will be supported with the E&M conversion device and new filter.

XIX. Voice Switch Upgrade

Ms. Michele Mascari discussed the voice switch upgrade. The voice switch upgrade is a CSOC initiative to replace the mission voice switching/recording systems. The effort has been scaled back to include JSC, MSFC, and GSFC only. (GSFC includes WFF, WSC, and MIL.) The first voice switch upgrade will occur at GSFC. The switch will be replaced and the ORR conducted in October 2002. JSC will be the next switch replaced, then MSFC. JSC/MSFC switch replacement/ORR is scheduled for 2003. All new switches have T1 interfaces.

Ms. Mascari stated that it would take approximately 5 months to implement the switch at GSFC. Ms. Mascari also noted that the PCD document covers the switches at all three sites. JSC will look at the PCD in October.

JSC voiced some concern that control of A/G, Space-to-Ground, and private voice functions will be allocated to MSFC. Mr. Joseph Aquino stated that he would facilitate a mission voice upgrade briefing with interested JSC elements to discuss this issue (Action Item 5-01-NSG-13).

XX. STS 50-Mbps Data Modem Upgrade

Ms. Mascari discussed the STS 50-Mbps data modem upgrade. GEAM provided an unsolicited proposal to upgrade data modems on Transponder 5 to a maintainable unit. GEAM has the units in house to upgrade all current Shuttle HRDVS receive sites (JSC, MSFC, ARC, JPL, GSFC). Installation is on hold pending the outcome of the SOMO Architecture Study Transponder 5 action item.

XXI. CSA Voice Study

Ms. Mascari stated that there are currently 24 voice circuits between JSC, CSA, and GSFC. The service between GSFC and CSA is a dedicated T1. All voice in the existing configuration is compressed to 24 kbps. Ms. Mascari noted that the current AT&T equipment does not support this compression.

Ms. Mascari provided ROM cost estimates for circuit implementation. Ms. Mascari noted that monthly recurring costs drop significantly with JSC/CSA direct implementation (as opposed to JSC/GSFC/CSA). Ms. Mascari recommended that JSC/CSA direct services be implemented when additional voice circuits are required. JSC noted that the current DA8 plan is to increase the number of voice circuits to CSA to 48.

XXII. 21st Space Operations Squadron Briefing

Mr. Scott Dubridge discussed Onizuka AFS two-way proficiency supports. These supports are conducted to exercise STS-unique equipment and sites and to maintain proficiency for operators. There is a problem at 21SOPS with OD TLM dropouts and no NSP bit/frame synch with uplink mod enabled. The problem is random and unpredictable. It is suspected that an uplink filter mod is causing the problem, though it hasn't been proven. The only thing that has been found to clear up the 192K drops is narrowing the IF bandwidth to 500K; however, this only helped sometimes. The problem is still being investigated. The current operational workaround is to narrow the IF bandwidth, lower the uplink power, and turn the Orbiter tone ranging OFF.

Following Mr. Dubridge's presentation, Mr. Morse inquired about the transition to unified S-band at all RTS sites. Mr. Dubridge stated that the Program would begin this effort around 2004.

XXIII. UHF A/G Overview

Mr. Clifton Gatewood provided a UHF air-to-ground overview. Mr. Gatewood reported that there is an over modulation problem with Oakhangar UHF A/G. UHF A/G was usable during STS-98, but had problems with over modulation. No UHF A/G downlink was received at

Oakhanger on both STS-102 and STS-100. Mr. Gatewood stated that a teleconference would be conducted tomorrow (5/18/01) with LION participating to discuss these issues. Scott Dubridge, Kevin Riley, and others were asked to attend.

XXIV. Space Shuttle Orbiter Module Memory Unit

Mr. Ray Rivas provided an overview of the Space Shuttle Orbiter Module Memory Unit (MMU). Mr. Rivas stated that it was decided to leave analog recording units off the MMU because they aren't used much any more. Solid State Mass Memory (SSMM) is now used. Mr. Rivas discussed simplified MMU/Orbiter interfaces. T-0 lines are used. J8 is used for test points. The power supply is 28 Volts. There are 5 GPC interfaces through J2. Mr. Rivas also discussed data rates. The MMU can record from 32-kb to 1-Mb data.

Mr. Aquino inquired whether GN sites could support 2048K dumps. Ms. Sidotti stated that they could support downlink but not transport. Mr. Sobchak stated that per RTS representatives, RTS sites could handle 2-Mb dumps.

XXV. Solid State Recorder Operations

Mr. J. Miller discussed Solid State Recorder (SSR) operations. The SSR functionality replaces ops. recorders on the Shuttle with minimal impact to ground networks. The SSR uses the existing Orbiter FM and Ku Channel 2 interfaces. All SSR dumps will be forward direction only. SSME dumps will be at 960K with no gaps between Engine 1, 2, and 3 data. OARE data dumps can be at 960K, 1024K, or 2048K (640K not available) with no gap between sample periods. Data rates available for troubleshooting are 32K, 64K, 128K, and 192K.

There will be several operational improvements with the SSR including more reliable hardware, no Ku I/Q reversals (verified at ESTL), no dump time lost to rewinding or track selection, and crystal controlled (frequency/jitter) accuracy on dump rates.

Mr. Sobchak inquired about SSR deployment. Mr. Miller stated that deployment is currently scheduled for STS-110 (February 2002). Every flight after STS-110 will support SSRs. Mr. Miller stated that STS-107 might move beyond STS-110, so JSC may have to revert back to ops. recorders for that flight.

Two action items were assigned as a result of this presentation. The first was assigned to Messrs. Kevin Haines (JSC) and John Smith (GSFC) to evaluate whether the SSR and FM transmitter can be taken to sites to exercise the FM dump capability (Action Item 5-01-NSG-14). The second was assigned to Mr. Haines to send an SSR deployment schedule to Mr. Smith (Action Item 5-01-NSG-15).

XXVI. Auxiliary Instrumentation System

Mr. Rusty Yates provided an overview of the Shuttle Auxiliary Instrumentation System (AIS). The AIS replaces the existing MADS/OEX controllers, recorders, and frequency division multiplexers with digital equipment. LLAFC and EAPU data will be recorded via new MIL-

STD-1553B data buses. PCMMU low-data-rate output will be recorded. All recorded and input data will be available via existing S-band FM, Ku-band, and T-0 telemetry links. The AIS will solve the obsolescence problem of the MADS/OEX tape recorder. Deployment of the AIS is currently scheduled for 2004.

XXVII. Nascom Block Phase Out Study

Mr. Larry Munzy stated that the NASA Space Operations Management Office (SOMO) has initiated a plan to phase out Nascom block processing. CSOC, JPL, and GSFC team members have agreed to proceed with CCSDS Space Link Extension (SLE) prime data service for future LEO and DSN missions. JPL has a plan in place to proceed with CCSDS SLE for 2003 and to phase out legacy service by 2003. GSFC is working on a plan to provide CCSDS SLE service for the SN by 2004. GN upgrade plans are in work. SOMO is working with NASA centers to develop an implementation plan. SOMO presented status to the Interagency Operations Advisory Group (IOAG) on May 10, 2001.

XXVIII. NACAIT Status

Mr. Joe Aquino discussed NACAIT status. The following was noted:

- a. Medical Operations: JSC is working on sending private data to medical operations.
- b. IOCO Document: This document is currently being worked.
- c. Latency: JSC is working on latency requirements. International partners are interested in this issue.
- d. HTV/ATV RFICD Support: Mr. John Smith/GSFC is leading this effort as a part of NACAIT.
- e. STS/ISS Budget/Re-Architecture: This is the arena that is being focused on the most. There are about 62 items associated with the STS/ISS budget/re-architecture. Some of the items include:
 1. ISS Video Distribution: It doesn't appear that JSC can get out of this contract. The ISS Program wants out. ISS video distribution will continue through 7A and 7A.1.
 2. MILA Ranging: The requirement for MILA ranging has been terminated.
 3. Voice Compression (32K to 24K; NSAP under 24K): A test is being conducted tonight (5/17/01) utilizing 4 circuits.
 4. Reclassification of voice/data criticality: This effort should save some NSAP circuits. This effort will take about three months.
 5. BDA support: There are no more UHF support requirements.

6. Meteosat: JSC is waiting for NOAA to finish the MOA.
7. Voice Over IP: Beta testing is currently underway at JSC. The operational date is October 2001.

XXIX. X-38 Program Status

Mr. Jim Siekierski presented X-38 Program status. The V201 flight is currently scheduled for February 20, 2003. The primary landing site is Woomera, Australia; the secondary site is Coober Peady, Australia. Power control, ECLS, data acquisition, avionics, structural components, and wiring are currently being added to the vehicle. The first vehicle level power on test will be conducted this week (week of 5/14/01). Regarding the S-band subsystem, there are two independent strings on the vehicle for redundancy. Each string contains a 4th Generation Motorola Transponder. There are a series of switches used for antenna selection. Mr. Siekierski stated that a lot of testing would be conducted at ESTL as close to the actual flight configuration as possible.

Regarding hardware status, one of the two transponders failed during the first lab test (could not establish 1553 comm.). The unit was returned to Motorola for repair. There are no problems with filters or diplexers. RF switches will be delivered in September 2001. Delivery of the S-band amplifier is scheduled for January 2002.

Mr. Siekierski discussed S-band predicted performance. In TDRS mode, the BS EIRP (60 deg) should be about 14.3 dBW. In GSTDN mode, EIRP should be about 8 dBW.

XXX. X-38 Mission Timeline

Mr. Stokes McMillan discussed the X-38 mission timeline. The current launch date is February 20, 2003 (STS-116). A brief power-up of core systems will be conducted on Flight Day 1 (FD1). Comm. system checkout will be conducted on FD2 and FD3. FD4 is deploy rehearsal day. Deploy to landing will be conducted on FD5. There will be 3 de-orbit opportunities to Australia on FD5. Mission control will be conducted from a POCC at JSC/Building 30. GSTDN sites being considered are DFRC, MILA, WPS, and Perth. On FD3, the vehicle will go down to 120 nmi circular (from 160). GSTDN testing will be conducted during this time frame.

There was a discussion regarding the V201 drop test. An action item was assigned to Mr. Sobchak to provide to Henry Allen (JSC) a list of commercial IDIQ and other site availability for the V201 drop test. Mr. Sobchak will also identify potential C-band trackers and associated costs for all sites (Action Item 5-01-NSG-16).

XXXI. Critical Support versus Highly Desirable

Ms. JoAnn Sidotti discussed critical versus highly desirable support. Ms. Sidotti stated that pre-mission, neither Shuttle nor ISS critical periods are being identified well to the Network for documentation purposes. Trying to get information from the Flight Control Team to Bob

Marriott to Ms. Sidotti has been an ongoing problem. Ed Klein, Bryan Austin, et al. have been working on this problem and it has been improving. The Network needs as much lead time as possible, pre-mission, for identification of critical periods. The minimum should be one week prior to launch. Ms. Sidotti stated that both programs (ISS and SSP) have stopped using the term "Highly Desirable." It is recommended that this category be deleted from the Flight Rules. There are now two categories (routine and critical). Ms. Sidotti also noted that a process is needed to identify ISS critical periods outside of a Shuttle mission period. ISS critical periods are sometimes identified just 24-48 hours in advance of the activities.

An action item was assigned to Ms. Sidotti to contact Mike Marsh/JSC regarding this presentation (Action Item 5-01-NSG-17).

XXXII. Voice Loop Distribution (JSC to MSFC)

Mr. Mike Blum discussed voice loop distribution (JSC to MSFC). Mr. Blum stated that inconsistent loop naming conventions, formats, and channelization assignments are being utilized in inter-center traffic and documentation. This information is documented in the NISN Mission Services Document, pre-mission electronic traffic from GSFC, and pre-mission electronic traffic from JSC. Comparisons between the NISN Mission Services Document, the electronic messages from GSFC and JSC, and the actual MSFC voice switch assignments reveal the following metrics:

- a. There are 197 loops between JSC and MSFC.
- b. There are 169 format errors (85.7 %).
- c. There are 37 channelization errors (18.8%).

Mr. Blum stated that a splinter meeting would be conducted with MSFC, JSC, and GSFC participating to discuss possible solutions to this problem. Regarding the channelization errors, Mr. Mike Allen/NISN stated that whenever there is a channel re-assignment, Tom Boggs/GSFC receives a Channel Change Request (CCR) and updates his database. This database is the most accurate, up-to-date database for this information.

Following this presentation, Mr. Sobchak inquired whether an MCWG or other comm. working group meeting is scheduled in the near future. An action item was assigned to Cheryl Dry (GSFC/NISN) and Michele Mascari (GSFC/NISN) to look into coordinating an Inter-Center Comm. Working Group (ICCWG) type forum to address ongoing Network comm. issues related to the SSP and ISS programs (Action Item 5-01-NSG-18).

XXXIII. Development of the Replacement MILA/PDL Task Order Solicitation

Mr. R. Sabatino reported that there would be a replacement for the existing MILA/PDL Ground Tracking Station. At the existing facility, there have been two failures in the last four launches. The risk is greater for failure at the existing facility than the risk of building a new state-of-the-

art replacement. Systems Design Reviews (SDRs) will mitigate risks; NASA and LM/CSOC will participate in the SDRs.

Currently, there are two qualified vendors contending for the replacement site. The vendors are Datalynx and Universal Space Network (USN).

Mr. Sabatino stated that once the new facility is operational, parallel operations for certification would be conducted for three consecutive Space Shuttle flights. The first and second flights will have replacement MILA as a backup to the existing MILA. The third flight will have replacement MILA as prime and existing MILA as backup.

XXXIV. TDRS H (F8) On Orbit Status

Mr. Sobchak presented TDRS 8 on orbit status. TDRS 8 is on orbit at 150 degrees West. The enhanced MA system has had some performance issues (degradation). The root cause has been identified (the electrostatic attraction of the sunshield to the MA elements causes degradation to the MA elements gain). Mr. Sobchak noted that TDRS 8 is not available for operational use. The date for operational use is unknown at this time.

XXXV. Dryden Status

Mr. Craig Griffith provided DFRC status. Mr. Griffith noted that Ms. Starla Carroll is the new RCO at DFRC for ISS/SSP. Regarding C-band status, Mr. Griffith stated that the DES replacement project is in the Critical Design Review (CDR) and prototype phase. The DES is an old system. A vendor has been working on the DES software and has fixed the low-speed data problem. DES is considered green at this time.

The new Tracking Space Positioning Information (TSPI) will eliminate the single point of failure of the DES. The upgrade will allow data to go directly to the antenna pedestals. Standard PCs with dual redundancy are being used. Dryden will sustain the system; they have an onsite contractor who will provide needed support. Mr. Griffith stated that this onsite contractor does outstanding work. The TSPI replaces the DES. There will still be an Edwards interface with this system.

Regarding S-band, Mr. Griffith stated that problems are still being experienced using Metrum recorders at 192 kb with ranging on. Regarding Viterbi decoders, Aydin bit syncs are still being used. Dryden is trying to transition to Avtec bit syncs. Mr. Griffith stated that he still owes the Network a report on S-band ranging problems. He is working on the report. The problems couldn't be duplicated by DFRC, ESTL, or GSFC. Mr. Sobchak stated that MILA will attempt to duplicate the problems, but he can't guarantee they will. GSFC may provide DFRC PSS support to attempt to duplicate and troubleshoot the problems; however, this is the same PSS GSFC used when they failed to duplicate the problems.

Regarding the ISS system, the DOS NOVA tracking software was replaced with NOVA for Windows. DFRC can now receive automated NORAD TLE data. Also, DFRC added C-band slaving for 4 Yagi antennas.

As a result of this presentation, an offline action item was assigned to Mr. Griffith to look into when and how much post landing testing was done with ATF-1/ATF-2 ranging ON/OFF after STS-100 landing (Action Item 5-01-NSG-Offline).

XXXVI. Overview of Configuration Management Freeze Policy for Human Spaceflight

Mr. Len Switalski provided an overview of the Configuration Management Freeze Policy for Human Spaceflight. Mr. Switalski noted that the freeze policy is a CSOC document. The AFSCN does not participate in the freeze policy. DFRC, Code 290/NISN, Site Managers, and Mr. Switalski will sign the document. Mr. Schneck stated that the document was sent out for review and received very few comments. The document is in good shape. Mr. Sobchak stated that NISN procedures need to be covered in the document. Mr. Switalski stated that review comments are currently being evaluated and will be incorporated in late May 2001. Final review is scheduled for early June 2001. It is planned to publish the Configuration Management Freeze Policy in mid-June 2001.

XXXVII. NISN/CSOC Work Freeze Policy

Mr. Jeff Volosin discussed the NISN/CSOC Work Freeze Policy. An action item was assigned to Mr. Volosin to send a Heads equipment list to Mr. Sobchak (Action Item 5-01-NSG-19). Mr. Sobchak will send a reply to the list to Mr. Volosin (Action Item 5-01-NSG-20).

XXXVIII. Action Items

The following action items were assigned at the May 16-17, 2001, NSG meeting.

ACTION ITEM: 5-01-NSG-01

ASSIGNEE(S): Fred Kleinknecht/CSOC/Houston

ACTION: Provide a breakdown of DSMC specific circuit requirements and a detailed diagram of the circuit interfaces.

ACTION ITEM: 5-01-NSG-02

ASSIGNEE(S): Fred Kleinknecht/CSOC/Houston

ACTION: Develop a customer interface forum to communicate DSMC transition plans to the customer community.

ACTION ITEM: 5-01-NSG-03

ASSIGNEE(S): Fred Kleinknecht/CSOC/Houston

ACTION: Provide a copy of the DSMC transition plan to Ted Sobchak/ND for dissemination.

ACTION ITEM: 5-01-NSG-04

ASSIGNEE(S): JoAnn Sidotti/GSFC/SMM

ACTION: Coordinate with Fred Kleinknecht (CSOC/Houston) regarding Mission Support Center requirements for SN monitoring.

ACTION ITEM: 5-01-NSG-05

ASSIGNEE(S): Bob Gonzales/WSC

ACTION: Identify the changes needed at the control centers and projects for the DSMC transition.

ACTION ITEM: 5-01-NSG-06

ASSIGNEE(S): Fred Kleinknecht/CSOC/Houston and Steve Sypher/WSC

ACTION: Explain how the DSMC Transition Plan will adhere to the JSC-2 Flight Follow Plan.

ACTION ITEM: 5-01-NSG-07

ASSIGNEE(S): Naresh Bansal/DSMC Program Manager

ACTION: Ensure a WSC/FDF Training and Certification Plan is developed and goes through the appropriate review cycles.

ACTION ITEM: 5-01-NSG-08

ASSIGNEE(S): Steve Sypher/WSC, Fred Kleinknecht/CSOC/Houston, Bruce Schneck/CSR/GSFC, JoAnn Sidotti/GSFC/SMM, and Bob Hudgins/WSC

ACTION: Determine how the existing data service provided for JSC GN scheduling (i.e., Leroy Henry) will continue into the DSMC era.

ACTION ITEM: 5-01-NSG-09

ASSIGNEE(S): Rod Thornton/KSC

ACTION: Determine whether KSC can provide another path through TMS from MILA to PDL.

ACTION ITEM: 5-01-NSG-10

ASSIGNEE(S): Jim Porterfield/MSFC/NISN and George Gassier/MSFC/NISN

ACTION: Determine how long it will take to get a cost estimate for conduit diversity in the tunnel from the KSC Toll Building to CD&SC.

ACTION ITEM: 5-01-NSG-11

ASSIGNEE(S): Harry Berman/GSFC/NCC and Frank Ibanez/USA/JSC

ACTION: Define what CAS parameters GSFC needs for the next two SSP flights and how Mr. Ibanez can send the data block to GSFC.

ACTION ITEM: 5-01-NSG-12

ASSIGNEE(S): JoAnn Sidotti/GSFC/SMM

ACTION: Ensure Harry Berman/NCC contacts Frank Ibanez/JSC regarding the CAS parameters issue.

ACTION ITEM: 5-01-NSG-13

ASSIGNEE(S): Joe Aquino/JSC/SOMO

ACTION: Facilitate a mission voice upgrade briefing to include all interested JSC elements. (JSC is concerned that control of A/G, Space-to-Ground, and private voice functions will be allocated to MSFC).

ACTION ITEM: 5-01-NSG-14

ASSIGNEE(S): Kevin Haines/JSC and John Smith/GSFC

ACTION: Evaluate whether the Solid State Recorder (SSR) and FM transmitter can be taken to sites to exercise the FM dump capability.

ACTION ITEM: 5-01-NSG-15

ASSIGNEE(S): Kevin Haines/JSC

ACTION: Send SSR deployment schedule to John Smith/GSFC.

ACTION ITEM: 5-01-NSG-16

ASSIGNEE(S): Ted Sobchak/GSFC/ND

ACTION: Provide to Henry Allen a list of commercial IDIQ and other site availability for the V201 drop test. Identify potential C-band trackers. Identify associated costs for all sites.

ACTION ITEM: 5-01-NSG-17

ASSIGNEE(S): JoAnn Sidotti/GSFC/SMM

ACTION: Contact Mike Marsh/JSC regarding critical support vs. highly desirable.

ACTION ITEM: 5-01-NSG-18

ASSIGNEE(S): Cheryl Dry/GSFC/NISN and Michele Mascari/GSFC/NISN

ACTION: Look into coordinating an Inter-Center Comm. Working Group (ICCWG) type forum to address ongoing Network comm. issues related to the SSP and ISS programs.

ACTION ITEM: 5-01-NSG-Offline

ASSIGNEE(S): Craig Griffith/DFRC

ACTION: Look into when and how much post landing testing was done with ATF-1/ATF-2 ranging ON/OFF after STS-100 landing.

ACTION ITEM: 5-01-NSG-19

ASSIGNEE(S): Jeff Volosin/CSOC/GSFC

ACTION: Send a HEDS equipment list to Ted Sobchak/ND.

ACTION ITEM: 5-01-NSG-20

ASSIGNEE(S): Ted Sobchak/ND

ACTION: Send reply to HEDS equipment list to Jeff Volosin/GSFC.

(Original Approved by:)

Ted Sobchak

GSFC/Network Director